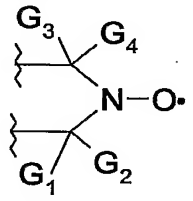
WHAT IS CLAIMED IS:

1. A process for the preparation of a sterically hindered amine ether which comprises reacting a corresponding sterically hindered aminoxide with a C_5-C_{18}alk-1-ene in the presence of an organic hydroperoxide.

2. A process according to claim 1, wherein the obtained product is subsequently hydrogenated.

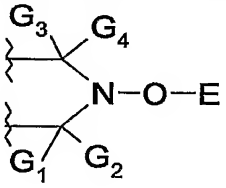
3. A process according to claim 1, wherein the sterically hindered amine oxide contains at least one group of formula (II)



(II)

wherein G_1, G_2, G_3 and G_4 are independently alkyl of 1 to 4 carbon atoms or G_1 and G_2 and/or G_3 and G_4 are together tetramethylene or pentamethylene.

4. A process according to claim 1 or 2, wherein the obtained sterically hindered amine ether contains at least one group of formula (III)



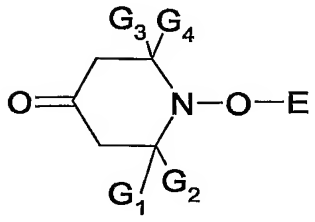
(III)

wherein G_1, G_2, G_3 and G_4 are as defined in claim 3 and

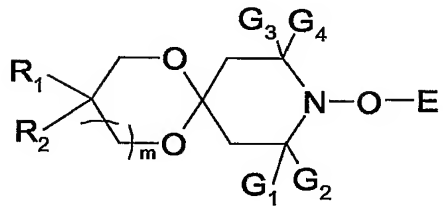
E is C_5-C_{18}alkyl or C_5-C_{18}alk-2-enyl.

5. A process according to claim 3 or 4, wherein G_1 and G_3 are methyl and G_2 and G_4 are independently methyl or ethyl.

6. A process according to claim 4, wherein the sterically hindered amine ether is of formula (A) to (O)



(A)



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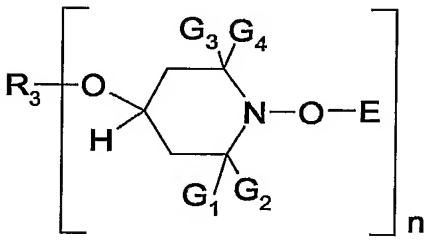
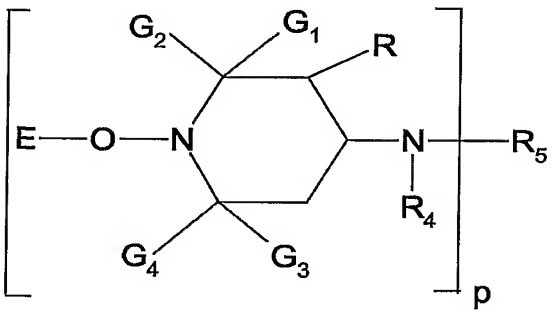
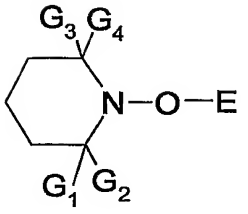


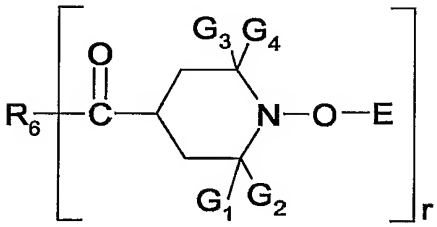
(C)



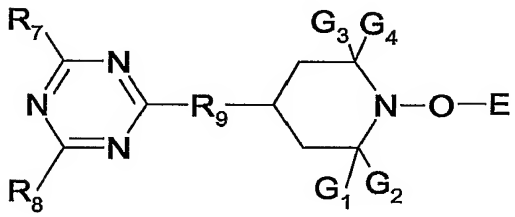
(D)



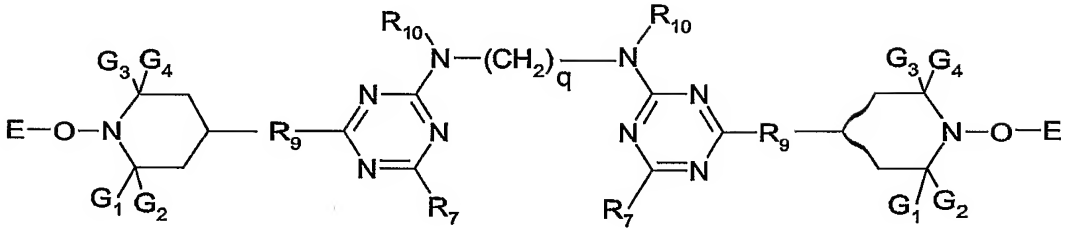
(E)



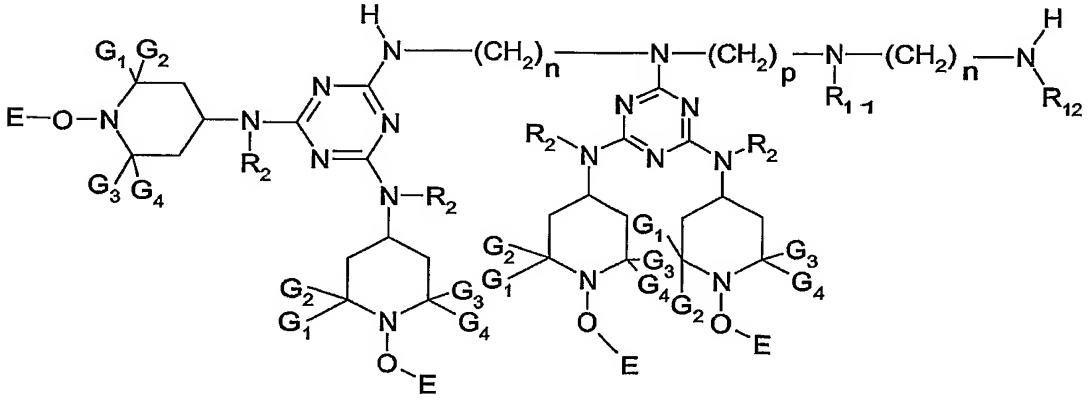
(F)



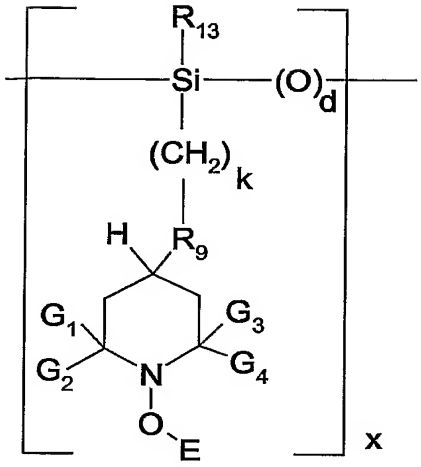
(G)



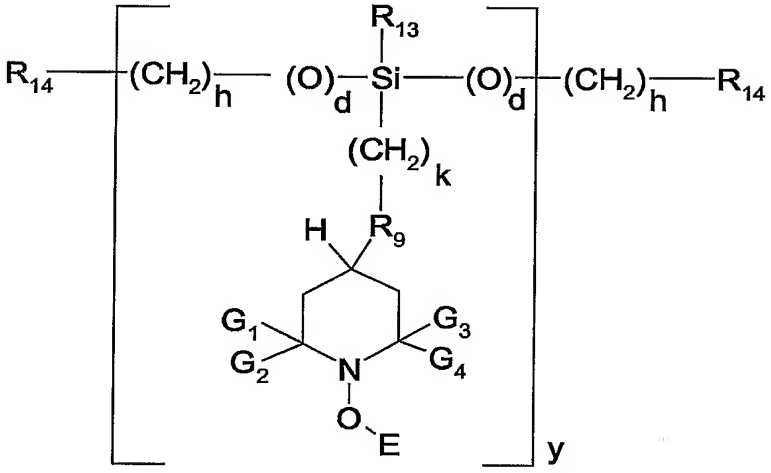
(H)



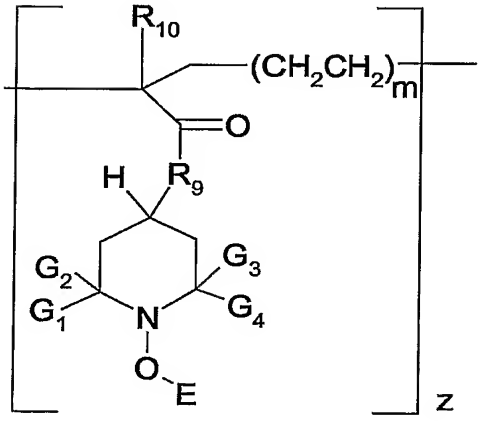
(I)



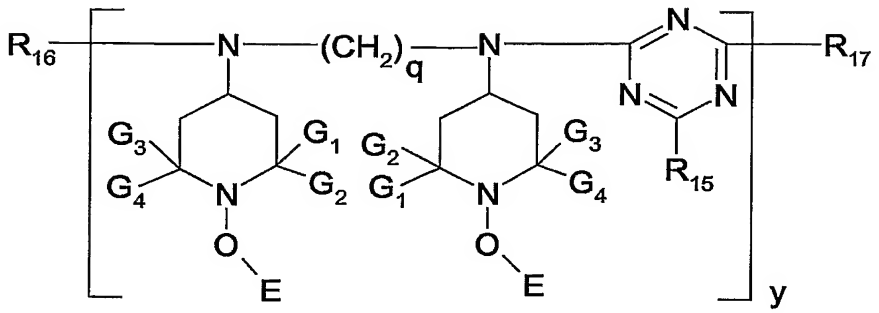
(K)



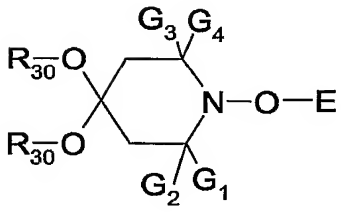
(L)



(M)



(N)



(O)

wherein G_1, G_2, G_3 and G_4 are as defined in claim 0 and
E is C_5-C_{18}alkyl or C_5-C_{18}alk-2-enyl;

m is 0 or 1;
R_1 is hydrogen, hydroxyl or hydroxymethyl;
R_2 is hydrogen, alkyl of 1 to 12 carbon atoms or alkenyl of 2 to 12 carbon atoms;

n is 1 to 4;

when n is 1,
R_3 is hydrogen, alkyl of 1 to 18 carbon atoms, alkoxycarbonylalkylenecarbonyl of 4 to 18 carbon atoms, alkenyl of 2 to 18 carbon atoms, glycidyl, 2,3-dihydroxypropyl, 2-hydroxy or 2-(hydroxymethyl) substituted alkyl of 3 to 12 carbon atoms which alkyl is interrupted by oxygen, an acyl radical of an aliphatic or unsaturated aliphatic carboxylic or carbamic acid containing 2 to 18 carbon atoms, an acyl radical of a cycloaliphatic carboxylic or carbamic acid containing 7 to 12 carbon atoms, or acyl radical of an aromatic acid containing 7 to 15 carbon atoms;

when n is 2,

R_3 is alkylene of 2 to 18 carbon atoms, a divalent acyl radical of an aliphatic or unsaturated aliphatic dicarboxylic or dicarbamic acid containing 2 to 18 carbon atoms, a divalent acyl radical of a cycloaliphatic dicarboxylic or dicarbamic acid containing 7 to 12 carbon atoms, or a divalent acyl radical of an aromatic dicarboxylic acid containing 8 to 15 carbon atoms;

when n is 3,
R_3 is a trivalent acyl radical of an aliphatic or unsaturated aliphatic tricarboxylic acid containing 6 to 18 carbon atoms, or a trivalent acyl radical of an aromatic tricarboxylic acid containing 9 to 15 carbon atoms;

when n is 4,
R_3 is a tetravalent acyl radical of an aliphatic or unsaturated aliphatic tetracarboxylic acid, especially 1,2,3,4-butanetetracarboxylic acid, 1,2,3,4-but-2-enetetracarboxylic acid, 1,2,3,5-pentanetetracarboxylic acid and 1,2,4,5-pentanetetracarboxylic acid, or R_3 is a tetravalent acyl radical of an aromatic tetracarboxylic acid containing 10 to 18 carbon atoms;

p is 1 to 3,
R_4 is hydrogen, alkyl of 1 to 18 carbon atoms or acyl of 2 to 6 carbon atoms or phenyl;

when p is 1,
R_5 is hydrogen, phenyl, alkyl of 1 to 18 carbon atoms, an acyl radical of an aliphatic or unsaturated aliphatic carboxylic or carbamic acid containing 2 to 18 carbon atoms, an acyl radical of a cycloaliphatic carboxylic or carbamic acid containing 7 to 12 carbon atoms, an acyl radical of an aromatic carboxylic acid containing 7 to 15 carbon atoms, or R_4 and R_5 together are $-(CH_2)_5CO-$, phthaloyl or a divalent acyl radical of maleic acid;

when p is 2,
R_5 is alkylene of 2 to 12 carbon atoms, a divalent acyl radical of an aliphatic or unsaturated aliphatic dicarboxylic or dicarbamic acid containing 2 to 18 carbon atoms, a divalent acyl radical of a cycloaliphatic dicarboxylic or dicarbamic acid containing 7 to 12 carbon atoms, or a divalent acyl radical of an aromatic dicarboxylic acid containing 8 to 15 carbon atoms;

when p is 3,
R_5 is a trivalent acyl radical of an aliphatic or unsaturated aliphatic tricarboxylic acid

containing 6 to 18 carbon atoms, or a trivalent acyl radical of an aromatic tricarboxylic acid containing 9 to 15 carbon atoms;

r is 1 to 4,

when r is 1,

R_6 is alkoxy of 1 to 18 carbon atoms, alkenyloxy of 2 to 18 carbon atoms, -NHalkyl of 1 to 18 carbon atoms or -N(alkyl)$_2$ of 2 to 36 carbon atoms,

when r is 2,

R_6 is alkylenedioxy of 2 to 18 carbon atoms, alkenylenedioxy of 2 to 18 carbon atoms, -NH-alkylene-NH- of 2 to 18 carbon atoms or -N(alkyl)-alkylene-N(alkyl)- of 2 to 18 carbon atoms, or R_6 is 4-methyl-1,3-phenylenediamino,

when r is 3,

R_6 is a trivalent alkoxy radical of a saturated or unsaturated aliphatic triol containing 3 to 18 carbon atoms,

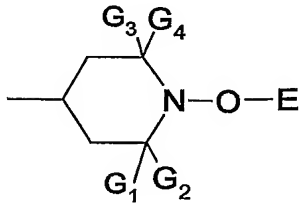
when r is 4,

R_6 is a tetravalent alkoxy radical of a saturated or unsaturated aliphatic tetraol containing 4 to 18 carbon atoms,

R_7 and R_8 are independently chlorine, alkoxy of 1 to 18 carbon atoms, -O-T_1, amino substituted by 2-hydroxyethyl, -NH(alkyl) of 1 to 18 carbon atoms, -N(alkyl)T_1 with alkyl of 1 to 18 carbon atoms, or -N(alkyl)$_2$ of 2 to 36 carbon atoms,

R_9 is oxygen, or R_9 is nitrogen substituted by either hydrogen, alkyl of 1 to 12 carbon atoms or T_1,

T_1 is

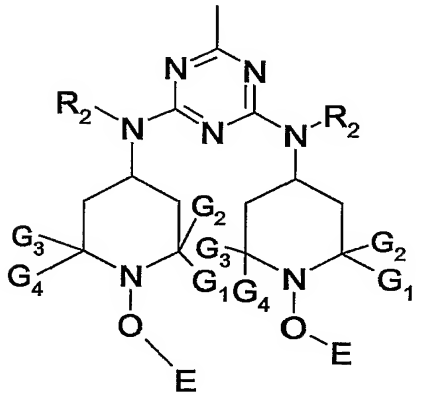


R_{10} is hydrogen or methyl,

q is 2 to 8,

R_{11} and R_{12} are independently hydrogen or the group T_2,

T_2 is



R_{13} is hydrogen, phenyl, straight or branched alkyl of 1 to 12 carbon atoms, alkoxy of 1 to 12 carbon atoms, straight or branched alkyl of 1 to 4 carbon atoms substituted by phenyl, cycloalkyl of 5 to 8 carbon atoms, cycloalkenyl of 5 to 8 carbon atoms, alkenyl of 2 to 12 carbon atoms, glycidyl, allyloxy, straight or branched hydroxyalkyl of 1 to 4 carbon atoms, or silyl or silyloxy substituted three times independently by hydrogen, by phenyl, by alkyl of 1 to 4 carbon atoms or by alkoxy of 1 to 4 carbon atoms;

R_{14} is hydrogen or silyl substituted three times independently by hydrogen, by phenyl, by alkyl of 1 to 4 carbon atoms or by alkoxy of 1 to 4 carbon atoms;

d is 0 or 1;

h is 0 to 4;

k is 0 to 5;

x is 3 to 6;

y is 1 to 10;

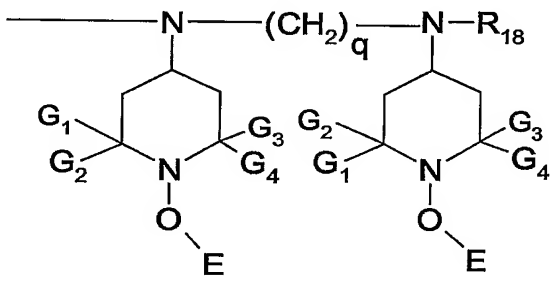
z is an integer such that the compound has a molecular weight of 1000 to 4000 amu, e.g. z may be from the range 3-10;

R_{15} is morpholino, piperidino, 1-piperizinyl, alkylamino of 1 to 8 carbon atoms, especially branched alkylamino of 3 to 8 carbon atoms such as tert-octylamino, -N(alkyl)T_1 with alkyl of 1 to 8 carbon atoms, or -N(alkyl)$_2$ of 2 to 16 carbon atoms,

R_{16} is hydrogen, acyl of 2 to 4 carbon atoms, carbamoyl substituted by alkyl of 1 to 4 carbon atoms, s-triazinyl substituted once by chlorine and once by R_{15}, or s-triazinyl substituted twice by R_{15} with the condition that the two R_{15} substituents may be different;

R_{17} is chlorine, amino substituted by alkyl of 1 to 8 carbon atoms or by T_1, -N(alkyl)T_1 with alkyl of 1 to 8 carbon atoms, -N(alkyl)$_2$ of 2 to 16 carbon atoms, or the group T_3,

T_3 is



R_{18} is hydrogen, acyl of 2 to 4 carbon atoms, carbamoyl substituted by alkyl of 1 to 4 carbon atoms, s-triazinyl substituted twice by -N(alkyl)$_2$ of 2 to 16 carbon atoms or s-triazinyl substituted twice by -N(alkyl)T_1 with alkyl of 1 to 8 carbon atoms;

R_{30} is hydrogen, alkyl of 1 to 18 carbon atoms, alkoxycarbonylalkylenecarbonyl of 4 to 18 carbon atoms, alkenyl of 2 to 18 carbon atoms, glycidyl, 2,3-dihydroxypropyl, 2-hydroxy or 2-(hydroxymethyl) substituted alkyl of 3 to 12 carbon atoms which alkyl is interrupted by oxygen, an acyl radical of an aliphatic or unsaturated aliphatic carboxylic or carbamic acid containing 2 to 18 carbon atoms, an acyl radical of a cycloaliphatic carboxylic or carbamic acid containing 7 to 12 carbon atoms, or acyl radical of an aromatic acid containing 7 to 15 carbon atoms.

7. A process according to claim 1, wherein the C_5-C_{18}alk-1-ene is C_6-C_{12}alk-1-ene.

8. A process according to claim 1, wherein the reaction is carried out in the presence of a further catalyst.

9. A process according to claim 8, wherein the further catalyst is selected from the group consisting of scandium, titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zinc, gallium, germanium, yttrium, zirconium, niobium, molybdenum, ruthenium, rhodium, palladium, silver, cadmium, indium, tin, antimony, lanthanum, cerium, hafnium, tantalum, tungsten, rhenium, osmium, iridium, platinum, gold, mercury, thallium, lead, bismuth; the compounds thereof; ammonium iodides and phosphonium iodides.

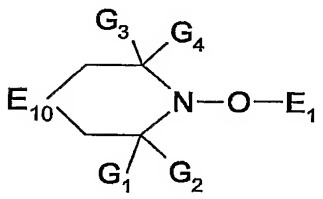
10. A process according to claim 8, wherein the further catalyst is selected from the group consisting of titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zinc, cerium; the halides and oxides thereof; ammonium iodides and phosphonium iodides.

11. A process according to claim 1, wherein the organic hydroperoxide contains 3-18 carbon atoms.

12. A process according to claim 2, wherein the hydrogenation is carried out in the presence of a hydrogenation catalyst.

13. A process according to claim 12, wherein the hydrogenation catalyst is selected from the group consisting of platinum, palladium, ruthenium, rhodium, Lindlar catalyst, platinum compounds, palladium compounds, ruthenium compounds, rhodium compounds, iridium compounds, nickel compounds, zinc compounds and cobalt compounds.

14. A mixture of sterically hindered amine ethers of formula (Za)

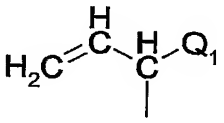


(Za)

wherein G_1, G_2, G_3 and G_4 are as defined in claim 3;

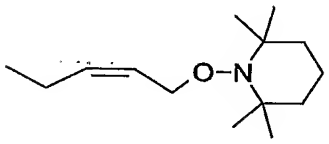
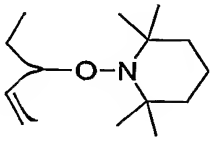
E_{10} is a carbon atom which is unsubstituted or substituted by –OH , =O or by one or two organic residues containing in total 1-500 carbon atoms and

E_1 is a mixture of the radicals

 (E_{1a}) and  (E_{1b})

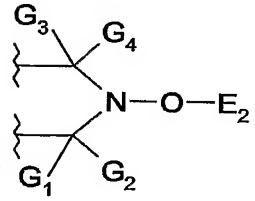
wherein Q_1 is C_2-C_{15} alkyl;

with the proviso that the mixture of sterically hindered amine ethers is not a mixture of compounds of formula (100) and (101)

 (100)  (101).

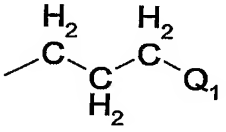
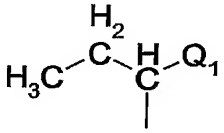
15. A mixture according to claim 14 of sterically hindered amine ethers represented by formulae (A) to (O) as defined in claim 6, wherein each E is replaced by E_1.

16. A mixture of sterically hindered amine ethers containing at least one group of formula (Y)

 (Y)

wherein G_1, G_2, G_3 and G_4 are as defined in claim 3 and

E_2 is a mixture of the radicals

 (E_{2a}) and  (E_{2b})

wherein Q_1 is C_2-C_{15} alkyl.

17. A mixture according to claim 16 of sterically hindered amine ethers represented by formulae (A) to (O) as defined in claim 6, wherein each E is replaced by E_2.

18. A mixture according to claims 14 to 17, wherein the ratio E_{1a}:E_{1b} and E_{2a}:E_{2b} respectively is independently from 1:9 to 7:3.

19. A process for flame retarding an organic material or stabilizing an organic material against degradation by light, oxygen and/or heat, which process comprises applying to or incorporating into said material a mixture of sterically hindered amine ethers as defined in claims 14 to 17.

20. A composition comprising
A) an organic material which is sensitive to oxidative, thermal and/or actinic degradation, and
B) at least one mixture of sterically hindered amine ethers as defined in claims 14 to 17.

21. A composition according to claim 20, comprising further additives.

22. A composition according to claim 21, comprising as further additives antioxidants, UV-absorbers, light stabilizers, metal deactivators, phosphites, phosphonites, hydroxylamines, nitrones, thiosynergists, peroxide scavengers, basic co-stabilizers, nucleating agents, fillers, reinforcing agents, benzofuranones, indolinones and/or flameproofing agents.